



## NMFS Northeast Fisheries Science Center

**N E W S**

### **Plankton Boost Detected in Northern Ocean Water off the U.S.**

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**Narragansett, RI** – This past summer, a key zooplankton species on the northern U.S. continental shelf was more than 14 times its 30-year average population size. The boost meant plenty of food for haddock and Atlantic cod born this year, and for endangered North Atlantic right whales in the area.

NOAA Fisheries scientists at the Northeast Fisheries Science Center's Narragansett Laboratory discovered the spike after reviewing this summer's field data. NOAA Fisheries is the federal agency charged with studying and managing living marine resources in U.S. waters.

Six species of copepods (tiny crustaceans) make up most of the zooplankton population in the Gulf of Maine and on Georges Bank. The very large zooplankton increase this year is attributed almost entirely to one of those species, *Calanus finmarchicus*, which also grow to the largest size among the six species. The increase in population was measured against the 1961-1990 average.

The *Calanus* increase likely occurred throughout the northern portion of the Northeast U.S. Continental Shelf large marine ecosystem (LME), which includes waters from Maine to North Carolina. An LME is a region of ocean space encompassing coastal areas from river basins and estuaries to the seaward boundaries of continental shelves and the outer margins of the major current

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systems.

“We think that the big increase may have happened because a mass of cold water from Labrador moved into the northeast shelf waters during the Spring, which really ratched up the chlorophyll level—meaning lots of microscopic plant life, and that’s what *Calanus* eat,” says Dr. Kenneth Sherman, who has worked on plankton in the Northeast since the early 1970s.

These observations add support to analyses conducted by the Narragansett Lab earlier this year that show phytoplankton and zooplankton production on the shallower Northeast Continental Shelf has been both robust and stable for nearly 25 years. This means that the base of the food web, primary producers and prey fields important to marine life, of the Northeastern Shelf LME is in good condition.

Sherman and other scientists have been collecting information on zooplankton abundance using commercial container vessels operating between Boston, Massachusetts and Halifax, Nova Scotia for the past 44 years. Zooplankton are collected on monthly transects by these vessels, along with contemporaneous data on sea water conditions during sampling. In recent years, the scientists have been able to compare these data with other observations gathered by NOAA and NASA satellite-bourne instrumentation that sense sea temperature and chlorophyll levels.

Satellite-derived imagery for Spring 2004 indeed shows both broad-scale chlorophyll increases and lower sea temperatures in Spring over the northern area of the Northeast Shelf large marine ecosystem. Analyses of the longer time-series of data also suggest that this year’s incursion of Labrador water is related to events further north, affecting the Scotian Shelf and Newfoundland-Labrador LMEs. In those systems, scientists have tracked increasing incursions of cooler water, believed to be the result of the southward movement of lower-salinity, colder waters introduced when Arctic ice melts.

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The observations reported are based on the multi-decadal Marine Resources Monitoring and Assessment (MARMAP) Program conducted by the Narragansett Laboratory. The MARMAP program is one of the ocean monitoring activities contributing information to NOAA's Earth Observing System.

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